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Majoring In Information Systems: Examining the Factors Affecting Student Choice

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ABSTRACT

Despite the increasing demand for information technology professionals in the job market, the number of undergraduates pursuing information systems (IS) degrees is declining. To improve student recruitment, it is important to understand the mechanisms by which students choose to pursue an IS major. This study focuses on the socio-cognitive factors that promote or inhibit the development of student choice behaviors specific to the IS major. The study utilizes Social Cognitive Career Theory and serves two important purposes. First, it develops valid and reliable measures specific to the IS context via a rigorous instrument development process. Second, it empirically tests a research model that can explain and predict student choice behaviors. The findings suggest that the instruments exhibit excellent levels of reliability and validity. Computer self-efficacy, outcome expectations, and student interest in IS were found to independently and cumulatively shape aspirations to choose the IS major. The findings and implications are discussed.

Keywords

Information systems education, social cognitive career theory, self-efficacy, curriculum, enrollment, recruitment

INTRODUCTION

The demand for information technology (IT) professionals in the United States continues to accelerate despite major economic challenges (e.g., outsourcing). In fact, recent employment forecasts from the U.S. Bureau of Labor Statistics highlight IT-related jobs as the fastest growing job category through 2012. More specifically, the employment in the major IT job categories of computer software engineers, computer systems analysts, and computer and information systems managers is expected to grow 46 percent, 39 percent, and 36 percent, respectively, between 2002 and 2012 (Hecker, 2004).

Despite the increasing demand for IT professionals in the job market, the number of undergraduates pursuing information systems (IS) degrees and careers is declining, representing a big challenge not only for academic institutions offering these degrees, but also companies that are in need of hiring skilled employees (George, Valacich, and Valor, 2005; Vegso, 2005). In addition, in an economy where most of the low level technical jobs have already been off-shored to countries like India and China, there is growing concern that declining enrollments might lead to an increase in off-shoring activities. Particularly, high level IS jobs requiring both technical and business skills are at risk. These jobs are still in the U.S., but this can change in the coming years if the IS enrollments continue to wane (Kessler, 2005).

An investigation of the pertinent literature shows that there is very limited research geared towards understanding the current decline in IS enrollments. For example, one recent study examined the rapid fall of student enrolments in IS programs from a macro viewpoint, tying enrolment fluctuations to job opportunities for graduates (George et al., 2005). Other studies have tended to focus on issues such as assessing individuals' career interests, values, and career motivations, etc., but only *after* they have entered the field of IS (Couger, 1989; Crepeau, Crook, Goslar and McMurtrey, 1992; Ferrat and Short, 1986). While these studies have advanced our knowledge considerably, they do not shed light on the factors that motivate students to pursue (or not pursue) IS majors and careers *before* formally declaring IS as their chosen field of pursuit. As such,

understanding the underlying factors that influence the selection of IS as a major, and eventually as a profession, is very important given the current economic environment and level of IS enrollments.

To this end, this study investigates the mechanisms by which students choose to pursue IS as their major. As a first step in a systematic program of research, this study utilizes Social Cognitive Career Theory (SCCT), which represents a comprehensive set of variables that influence career-related choice behaviors over time. The framework is conceptualized as relevant to both academic and career behaviors. The SCCT framework is subsequently adapted to the IS context, meaning that it is necessary to tailor the construct operationalizations to the specific domain of interest. As such, this research serves two primary purposes. First, a set of valid and reliable measures specific to IS are created via a rigorous instrument development process. Second, the scales are deployed as part of a survey, which is used to empirically test the veracity of the research model in the context of IS major choice.

The remainder of this paper is organized as follows. The next section provides a brief overview of the SCCT, which serves as the cornerstone for this study. A research model, specifically tailored to the domain under investigation, is then put forth, as well as interrelated set of hypotheses designed to test the model. The research methodology is subsequently outlined and the results presented. The paper concludes with a discussion of the findings and implications.

LITERATURE REVIEW

SCCT is a conceptual framework developed to understand the processes through which people develop educational and vocational interests, make career-relevant choices, and achieve performances of varying levels in their educational and occupational pursuits (Lent et al. 1994; Lent, Brown, Nota and Soresi, 2003). SCCT was developed based on Bandura's (1986) general Social Cognitive Theory (SCT), which proposes that psychosocial phenomena are reciprocally determined by personal, environmental, and behavioral factors. Borrowing from SCT, SCCT emphasizes the central role of socio-cognitive factors in enabling people to assert personal control over their educational and occupational behaviors, efforts, and attainments. Moreover, SCCT focuses on the environmental variables that may either promote or restrict the exercise of personal control. It also allows the incorporation of additional personal (e.g. race/ethnicity, gender, ability, personality traits, and educational experiences, etc.) to investigate their effects on career choices and outcomes (Lent et al., 2003). Figure 3 represents the SCCT framework. Since the opportunity to sway students typically disappears after another major has been chosen, the current study concentrates on a particular subset of SCCT¹, known as the Choice Goals Model, which focuses on the mechanisms functioning in pre-choice situations. We focus on pre-choice because the opportunity to persuade a prospective student typically disappears after a different major has been chosen.

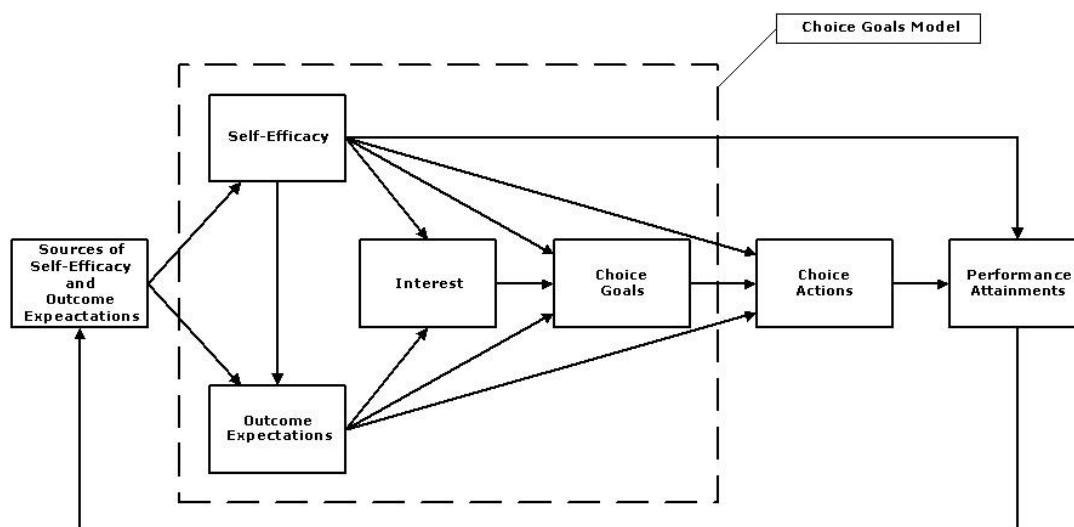


Figure 1. SCCT-Model of How Basic Career Interests Develop over Time (Modified from Lent et al. 1994)

¹ Due to space limitations, only the constructs contained within the focus of the study are discussed herein. For a more detailed discussion of the SCCT framework, interested readers are encouraged to consult Lent et al. (1994) and Lent et al. (2003).

The Choice Goals Model focuses on four factors - self-efficacy, outcome expectations, interest, and choice goals - that are particularly relevant to the academic choices. *Self-efficacy* refers to a perception of one's ability to organize and execute courses of action to accomplish a particular task (Bandura, 1986). Self-efficacy beliefs help determine one's choice of activities and environments, as well as one's efforts, persistence, thought patterns, and emotions when faced with impediments (Lent et al., 1994). Self-efficacy functions by providing individuals with a set of beliefs regarding their capabilities to exercise control over their actions and the environment. Environmental factors, which include the tools and resources at one's disposal, can also have a profound influence on self-efficacy perceptions. Self-efficacy beliefs have been shown to motivate and govern behavior across a broad range of settings, including academic achievement, job performance, athletic prowess, goal attainment, and faculty research productivity (Bandura, 1997).

Self-efficacy perceptions are concerned with a judgment concerning the capabilities one currently possesses to accomplish a given behavior (i.e., "can I do this?"), whereas *outcome expectations* capture the perceived likelihood that favorable consequences will occur after one has acted (i.e., "if I do this, what will happen?") (Bandura, 1986; 1997). Different categories of outcome expectations that might affect behavior have been identified in the literature, including physical (e.g., stress), social (e.g. salary, ability to find a job), and self-evaluative (e.g., pride, sense of accomplishment) varieties (Bandura, 1986). Although behaviors must be carried out to realize outcomes, individuals do consider prospective outcomes before undertaking a particular task (Bandura 1986, 1997). Therefore, self-efficacy alone may not be sufficient to stimulate an individual to engage in a particular behavior. An individual may lack the necessary motivation, unless he or she expects the behavior to produce favorable outcomes. On the other hand, self-efficacy and outcome expectations are interrelated. A person possessing a robust sense of efficacy is more likely to believe that favorable consequences will arise from her or his actions (Bandura, 1986; 1997).

Interest is defined as an emotion that arouses attention to, curiosity about, and concern with a particular educational or career path. Even though individuals may try out and pursue many different activities (potentially academic and career related) throughout their formative years, they end up developing distinctive patterns of academic and career interests, as certain activities differentially intrigue people to varying degrees over time (Bandura, 1986).

According to the SCCT, *choice goals* play an important role in the self-regulation of behavior. Choice goals can be defined as the determination to engage in a particular activity or to affect a particular future outcome (Bandura, 1986). People set goals to organize and guide their behavior, and to increase the likelihood that desired outcomes will be attained. Goals play an important role in decision making theories, including career choice decisions. In this respect, career plans, aspirations, and expressed choices are considered as goal mechanisms (Lent et al., 1994).

RESEARCH MODEL AND HYPOTHESES

Based on the above discussions, the following research model is put forward. As depicted in the model, we expect self-efficacy (computer self-efficacy), outcome expectations, and interests to independently and cumulatively affect choice goals in the IS field.

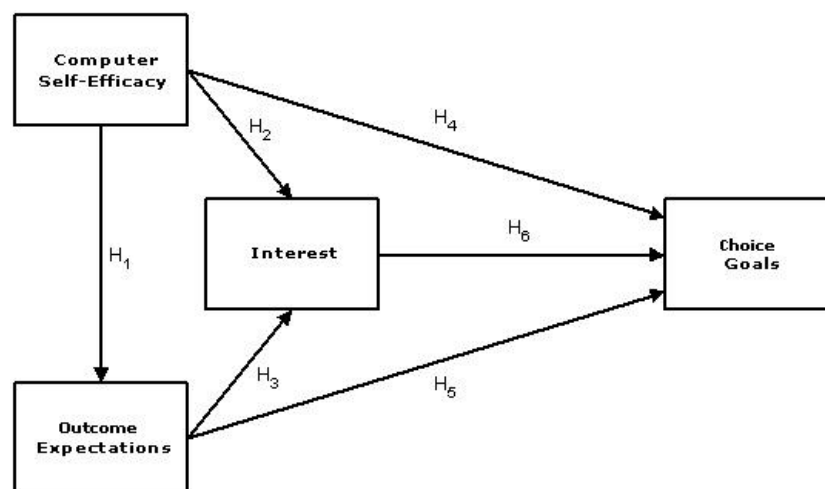


Figure 2. Research Model

Individuals are exposed to a wide variety of activities of potential career relevance during their childhood and adolescence years. As such, through repeated activity engagement, modeling and feedback from others, children and adolescents improve their skills, develop personal performance standards, form a sense of efficacy in particular tasks, and acquire certain expectations about the outcomes of their performance. These perceptions of self-efficacy and outcome expectations play an important role in the formation of educational and vocational interests.

Specific to the domain investigated, *computer self-efficacy* plays a central role across a variety of IT settings including training (Agarwal, Sambamurthy and Stair, 2000; Compeau and Higgins, 1995a; Johnson and Marakas, 2000), technology acceptance (Taylor and Todd, 1995), technology use (Compeau and Higgins, 1995b; Compeau, Higgins and Huff, 1999) to name a few. Computer self-efficacy is defined as “an individual judgment of one's capability to use a computer” (Compeau and Higgins, 1995b, p. 192). Rather than capturing capabilities associated with a specific application, the construct is operationalized as general computer self-efficacy (Marakas, Yi and Johnson 1998), which encompasses a broad range of computing situations that IS majors typically confront.

People tend to form enduring interests in activities in which they view themselves as capable (Bandura and Schunk, 1981). Similarly, when an individual expects an undertaking to result in favorable outcomes, he or she will be more likely to find that activity compelling and develop an interest (Lent et al. 1994). Thus, it is reasonable to assume that individuals with higher levels of computer self-efficacy and outcome expectations will be more interested in pursuing majors and careers within the field of IS.

Research has shown that self-efficacy beliefs influence outcome expectations (Bandura, 1986; 1987; Compeau and Higgins, 1995a, 1995b; Compeau et al. 1999). In general people expect to achieve desirable outcomes in activities at which they have higher self-efficacy. Self-efficacy alone might not lead to formation of interest in a particular area unless people expect their activity to be rewarded. Therefore, if the individual has a high self-efficacy but low outcome expectations, he or she might be less likely to develop an enduring interest in that activity (Lent et al., 1994). Based on the preceding logic, the following hypotheses are offered:

H₁: Computer self-efficacy will have a significant positive influence on outcome expectations.

H₂: Computer self-efficacy will have a significant positive influence on interest.

H₃: Outcome expectations will have a significant positive influence on interest.

Outcome expectations can also affect choice goals directly. People develop goals because of their interest in these activities and the rewards that they expect to receive. The higher the perceived outcomes, the more likely that people will adopt particular career goals. Like outcome expectations, self-efficacy beliefs are also assumed to have direct effects on choice goals. These independent effects of self-efficacy and outcome expectations may help explain career choice when opportunities to implement interests are perceived as limited (Lent et al., 1994). Therefore, the following hypotheses are put forth:

H₄: Computer self-efficacy will have a significant positive influence on choice goals.

H₅: Outcome expectations will have a significant positive influence on choice goals.

Research states that people tend to select career options that match their primary career interests (Holland, 1985). Therefore, it is possible to say emergent interests in turn lead to cognized career choice goals for further activity exposure, (i.e. intention plans, or aspirations to engage in a particular career direction) increasing the likelihood of subsequent choice actions and practice (e.g., declaring a corresponding major) (Lent et al., 1994). Therefore, the following hypothesis is offered:

H₆: Interest will have a significant positive influence on choice goals.

METHODOLOGY

Given the objectives of the study, the survey method presented the most appropriate approach. The sample and procedure, measures, and the data analysis are discussed in the following subsections.

Sample and Procedures

The sample consisted of students enrolled in an introductory IS course at a large state university. This course is designed to provide students with a basic understanding of information systems and how they support modern businesses. The survey was conducted online at the beginning of the semester and participation was completely voluntary. Students who had already

chosen a major were removed from the sample. 205 usable responses were obtained. 52.8 % of respondents were male and respondents averaged 20.69 years of age ($SD = 1.94$).

Measures

Special emphasis was placed on the operationalization of the constructs in the research model. A total of four measures were required to test the hypotheses. A review of literature was undertaken to identify existing measures. Only once scale (computer self-efficacy scale) was available in its current form. Although existing scales were available to measure the remaining constructs, they were not specifically tailored for the domain of interest. Since outcome expectations, interest, and choice goals are related to domain specific (IS Major) judgments, the use of the existing scales was not possible. Therefore, the scales to measure these three constructs were custom developed for this particular study.

An existing computer self-efficacy scale, consisting of 10 items was used to measure of self-efficacy (Compeau and Higgins, 1995b). Participants were asked to respond dichotomously ("yes" or "no"), with "no" indicating that the respondent did not believe he or she could complete the task. For each "yes" response, participants indicated their level of conviction in completing the task on a scale anchored from 1 (*Not At All Confident*) to 10 (*Totally Confident*). A "no" response for a particular item was scored as 0, whereas a "yes" response was scored based on the 1 to 10 rating, yielding an item score ranging from 0 to 10. Outcome expectations were measured via 19 items. The response format consisted of an 11-place scale capturing likelihood in percentage terms ranging from 0% (*Will Never Occur*) to 100% (*Will Always Occur*). Responses were coded from 0 (0%) to 10 (100%). Interest and choice goals were measured via 15 and five items, respectively. For each, 7-place Likert-type scales ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*) were utilized.

When new measures are developed, they need to be subjected to empirical testing to confirm their reliability and validity. To be considered a valid and reliable measure of the construct, the measure must demonstrate construct validity, which refers to the extent that the instrument measures the construct it intends to measure (Cook and Campbell, 1979). In order to satisfy construct validity; content, convergent, discriminant and nomological validity must be established. To fulfill these requirements, the instrument development process was divided into four phases. The first phase, *item generation*, served to create items for the outcome expectations, interests, and choice goals constructs, ensuring content validity. The research team generated an initial set of items, which a panel of academicians with expertise in SCT and psychometrics were asked to review and recommend changes. The second phase, *pretesting*, empirically assessed which of the items accurately represented their respective constructs. In this phase, the preliminary instruments were administered to a pool of students in an introductory IS course. Responses were factor analyzed using principal components analysis. Consistent with prior research, items that loaded at 0.707 or above on one factor (Gefen, Straub and Boudreau, 2000) and less than 0.40 on any other factor (Chin, Gopal and Salisbury 1997) were utilized to identify acceptable items. The third phase, *validity and reliability assessment*, established the convergent and discriminant validity of the measures, as well as their reliability. The fourth stage, *nomological validity*, empirically tested the veracity of the constructs within the context of the research model. The results associated with the third and fourth phases are discussed in the Measurement Model Analysis and Structural Model Analysis subsections, respectively.

Data Analysis

Partial least squares (PLS) was chosen to analyze the research model (Barclay, Higgins and Thompson, 1995; Wold, 1985). The psychometric properties of the measurement model were confirmed prior to estimating structural model parameters, as discussed in the following subsections.

Measurement Model Analysis

Indicators and constructs were examined in three stages following Barclay et al. (1995). First, the reliability of each construct was examined to ensure the items collectively measured their intended construct consistently (Gefen et al., 2000). Internal consistency reliability was examined in two ways – Cronbach's α (Nunnally, 1978) and composite reliability (Fornell and Larcker, 1981). Table 1 depicts the internal consistency reliability estimates. In all cases, the generally agreed upon lower limit of 0.70 for each type of reliability (Nunnally, 1978; Fornell and Larcker, 1981) was achieved, confirming reliability of the scales.

Convergent validity can be assessed at the individual item and construct levels by examining individual item loadings and the average variance extracted (AVE), respectively (Fornell and Larcker 1981). Individual item loadings, which represent squared multiple correlations, of 0.707 or greater (Gefen et al. 2000) imply that the indicator shares more variance with its construct than error variance, whereas AVE of 0.50 or greater (Fornell and Larcker 1981) demonstrates the construct as a whole shares more variance with its indicators compared to error variance. As shown in Table 2, with the exception of 1 indicator (1

computer self-efficacy item [CSE9]), individual items exhibited adequate loadings. No unacceptable cross-loadings emerged. Collectively, the items demonstrated acceptable convergent validity, as AVE surpassed the recommended threshold for all constructs (see Table 1).

Construct	α^b	CR ^c	AVE ^d	Construct ^a			
				CSE	OEXP	INTRST	CGOAL
CSE	0.919	0.933	0.585	0.765			
OEXP	0.974	0.977	0.688	0.354	0.829		
INTRST	0.980	0.982	0.781	0.439	0.493	0.884	
CGOAL	0.969	0.977	0.894	0.265	0.311	0.664	0.946

^aDiagonal elements (in bold) represent the square root of the average variance extracted (AVE). Off-diagonal elements represent the correlations among constructs.

^bCronbach's α , ^cComposite reliability, ^dAverage variance extracted

Table 1. Construct Reliability, Correlations, and Discriminant Validity

Finally, discriminant validity was assessed by comparing the AVE associated with each construct to the correlations among constructs (Barclay et al., 1995). The calculations emerging from the discriminant validity analysis are provided in Table 2. Diagonal elements represent the square root of the AVE, whereas the off-diagonal elements represent the correlations among constructs. In order to claim discriminant validity, diagonal elements should be larger than any other corresponding row or column entry. According to the results, each construct sufficiently differed from other constructs and, therefore, the discriminant validity of each construct was established.

Although one individual item failed to demonstrate convergent validity at the adopted threshold, it loaded above 0.60 and convergent validity was established at the construct level in this situation. Given this evidence, combined with strong reliability and discriminant validity estimates, the psychometric properties of measures were deemed acceptable.

Construct/Item	Loading	Construct/Item	Loading
Computer Self Efficacy		Outcome Expectations	
CSE1	0.8308	OEXP1	0.7824
CSE2	0.7888	OEXP2	0.7744
CSE3	0.7986	OEXP3	0.8105
CSE4	0.8125	OEXP4	0.8352
CSE5	0.7407	OEXP5	0.8795
CSE6	0.7581	OEXP6	0.8249
CSE7	0.7179	OEXP7	0.8092
CSE8	0.7556	OEXP8	0.8393
CSE9	0.6828	OEXP9	0.8434
CSE10	0.7488	OEXP10	0.7918
		OEXP11	0.8498
Interest		OEXP12	0.8191
INTRST1	0.8949	OEXP13	0.8270
INTRST2	0.8631	OEXP14	0.8510
INTRST3	0.9078	OEXP15	0.8529
INTRST4	0.9036	OEXP16	0.8233
INTRST5	0.8928	OEXP17	0.8562
INTRST6	0.8987	OEXP18	0.8246
INTRST7	0.9066	OEXP19	0.8533
INTRST8	0.8801		
INTRST9	0.9066	Choice Goals	
INTRST10	0.8715	CGOAL1	0.8825
INTRST11	0.8283	CGOAL2	0.9697
INTRST12	0.7717	CGOAL3	0.9437
INTRST13	0.9051	CGOAL4	0.9681
INTRST14	0.9131	CGOAL5	0.9597
INTRST15	0.8990		

Table 2. Constructs, Items, and Loadings

Structural Model Analysis

The structural model was tested by estimating the path coefficients among constructs. Path coefficients should be directional and exhibit appropriate significance for a particular hypothesis to be supported. Statistical significance at the 0.05 level was determined using two-tailed tests based on the bootstrap resampling method with 500 samples. The results of the structural model analysis are depicted in Figure 3.

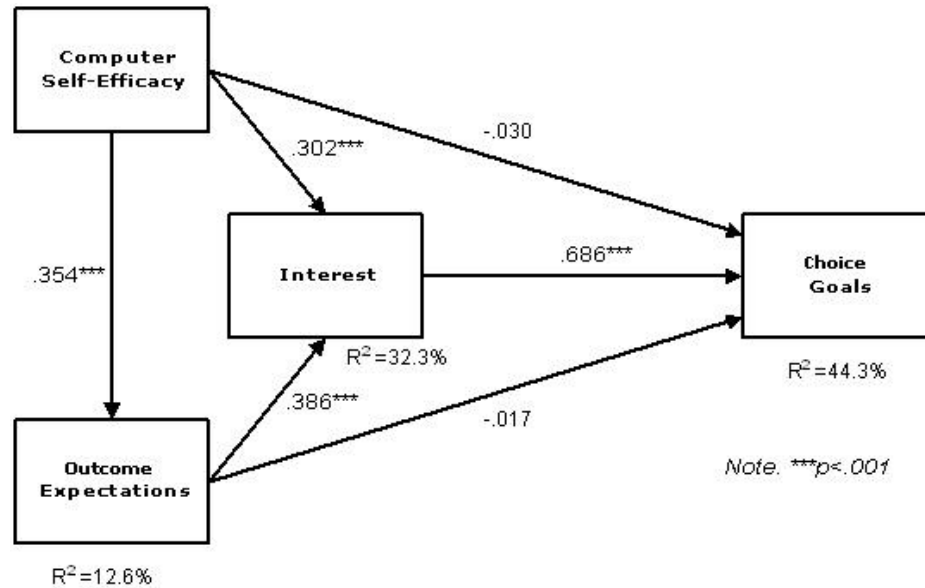


Figure 3: Structural Model Results

As expected, computer self-efficacy was a significant predictor of outcome expectations (0.354), supporting hypothesis H_1 . Computer self-efficacy accounted for 12.6 percent of the variance in outcome expectations. Both computer self-efficacy (0.302) and outcome expectations (0.386) were significant predictors of interest, together accounting for 32.2 percent of the variance. These estimates provide support for H_2 and H_3 , respectively. H_4 , H_5 , and H_6 predicted the main effects of computer self-efficacy, outcome expectations, and interest on choice goals, respectively. Collectively, the predictors accounted for 44.3 percent of the variance in choice goals. Despite our expectations, neither computer self-efficacy (-.030) nor outcome expectations (-.017) served as significant predictors of choice goals. As a result, no support was offered for hypotheses H_4 and H_5 . However, as expected, interest (0.686) was a significant positive predictor of choice goals, supporting hypothesis H_6 . Table 3 provides a summary of hypotheses testing.

Hypothesis	Coefficient	t-stat		Conclusion
H_1 : Computer self-efficacy will have a significant positive influence on outcome expectations.	0.354	4.9229	***	Supported
H_2 : Computer self-efficacy will have a significant positive influence on interest.	0.302	5.4772	***	Supported
H_3 : Outcome expectations will have a significant positive influence on interest.	0.386	6.5054	***	Supported
H_4 : Computer self-efficacy will have a significant positive influence on choice goals.	-0.030	0.5513		Not Supported
H_5 : Outcome expectations will have a significant positive influence on choice goals.	-0.017	0.3482		Not Supported
H_6 : Interest will have a significant positive influence on choice goals.	0.686	12.6465	***	Supported

*** $p < .001$ (2-tailed)

Table 3. Summary of Hypotheses Testing

DISCUSSION

Given recent economic trends and the disturbing decline in IS student enrolment, it is important to understand the factors affecting students' interest in and pursuit of IS majors and careers. Adapting and applying an existing framework to the IS domain, the study focused on the socio-cognitive factors that promote or inhibit the development of interests and choices within the IS field. As a result, the study's primary purposes were twofold: (1) to develop valid and reliable measures that are customized for the domain of the study, (2) to empirically test a research model that accounts for how interests and choice goals develop within the IS field. Based on the results, these objectives were successfully achieved. The measures exhibited admirable psychometric properties and general support was provided for the proposed research model. As expected, the results suggest that computer self-efficacy and outcome expectations play an important role in predicting interest. This finding is consistent with the theoretical assertion that people are likely to develop interest in activities at which they feel efficacious and at which they expect to receive positive rewards (Lent et al., 1994). Our findings also provided strong support for the positive relationship between interests and choice goals, confirming that emergent interests lead to cognized choice goals for future activity exposure (Lent et al., 1994). On the other hand, our results did not provide support for the direct effects of computer self-efficacy and outcome expectations on choice goals. Rather, the effects of self-efficacy and outcome expectations are channeled indirectly on goals through interests. Finally, computer self-efficacy leads to more robust outcome expectations. Students who deem themselves as capable of succeeding as IS majors are more likely to develop expectations of valued rewards. Combined, it is reasonable to conclude that computer self-efficacy beliefs serve as the activating mechanism kicking off a chain psychological events that influence student's aspirations to pursue an IS major.

Understanding these relationships can help educators to develop specific strategies and interventions to attract larger pools of students to the IS discipline. There is support in the IS literature, which states that domain-specific self-efficacy and outcome expectations can be increased through appropriate training techniques, which in turn result in lower levels of anxiety and improved performance (Compeau and Higgins, 1995b). As such, the knowledge gained through this study can enable scholars to apply the most effective teaching methods and techniques aimed at increasing students' sense of efficacy and the positive outcomes they expect to derive from their work. This has the potential to increase student success in the classroom, provide a richer and more engaging learning environment for students, and foster interest in their upcoming careers.

Going forward, future studies should extend the current research model by tracking subsequent "choice actions" in the form of enrollment in advanced IT courses, formally majoring in IS, interviewing for IS positions, accepting IS positions, and the like. This will allow interests and choice behaviors to be examined longitudinally, while extending the explanatory and predictive power of the model.

Adapting and applying the SCCT framework has the potential to guide inquiry in a diverse range of contexts. For instance, our findings can potentially help explain and predict the career development of women and minorities in IT professions. Since the purpose of this study was to gain a high-level understanding of the factors affecting choice goals, the roles of gender and race/ethnicity were not investigated. However, the under-representation of women and minorities in the IT industry continues to be a major concern for individual researchers, professional organizations, and federal agencies (Strober and Arnold, 1987; Leveson, 1989; Henwood, 1993). In this respect, the findings of the current study can be leveraged to devise methods for encouraging women and minorities to pursue IT careers.

REFERENCES

1. Agarwal, R., Sambamurthy, V. and Stair, R.M. (2000) Research Report: The Evolving Relationship between General and Specific Computer Self-Efficacy - An Empirical Assessment, *Information Systems Research*, 11,4, 418-430.
2. Bandura, A. (1997) *Self-Efficacy: The Exercise of Control*, W.H. Freeman and Company: New York.
3. Bandura, A. (1986) *Social Foundation of Thought and Action: A Social Cognitive Theory*, Prentice Hall: Englewood Cliffs, NJ.
4. Bandura, A. and Schunk D.H. (1981) Cultivating Competence, Self-Efficacy, and Intrinsic Interest through Proximal Self-Motivation, *Journal of Personality and Social Psychology*, 56, 805-814.
5. Barclay, D., Higgins, C. and Thompson, R. (1995) The Partial Least Squares Approach to Causal Modeling: Personal Computer Adoption and Use as an Illustration, *Technology Studies*, 2, 285-324.
6. Chin, W.W., Gopal, A. and Salisbury, W.D. (1997) Advancing the Theory of Adaptive Structuration: The Development of a Scale to Measure Faithfulness of Appropriation, *Information Systems Research*, 8,4, 342-367.
7. Couger, J.D. (1989) New Challenges in Motivating MIS Personnel, *Journal of Information Systems Management*, 6,4, 36-41.

8. Crepeau, R.G., Crook, C.W., Goslar, M.D. and McMurtrey, M.E. (1992) Career Anchors of Information Systems Personnel, *Journal of Management Information Systems*, 9,2, 145-160.
9. Compeau, D.R., Higgins, C.A. and Huff, S. (1999) Social Cognitive Theory and Individual Reactions to Computing Technologies, *MIS Quarterly*, 23, 145-158.
10. Compeau, D.R. and Higgins, C.A. (1995a) Application of Social Cognitive Theory to Training for Computer Skills, *Information Systems Research*, 6, 118-143.
11. Compeau, D.R. and Higgins, C.A. (1995b) Computer Self-Efficacy: Development of a Measure and Initial Test, *MIS Quarterly*, 19, 189-211.
12. Cook, T.D. and Campbell, D.T. (1979) *Quasi-Experimentation: Design and Analysis Issues for Field Settings*, Rand McNally, Chicago.
13. Ferrat, T.W. and Short, L.E. (1986) Are IS People Different: An Investigation of Motivational Differences, *MIS Quarterly*, 10, 4, 377-387.
14. Fornell, C. and Larker, D.F. (1981) Evaluating Structural Equation Models with Unobserved Variables and Measurement Error, *Journal of Marketing Research*, 18, 39-50.
15. Gefen, D., Straub, D.W., and Boudreau, M.C. (2000) Structural Equation Modeling and Regression: Guidelines for Research Practice, *Communications of the AIS*, 4,7.
16. George, J.F., Valacich, J.S., and Valor, J. (2005) Does Information Systems Still Matter? Lessons for a Maturing Discipline, *Communications of the AIS*, 16, 219-232.
17. Hecker, D.E. (2004) Employment projections through 2012. *Monthly Labor Review*, U.S. Bureau of Labor Statistics, Washington, DC, February 2004.
18. Henwood, F. (1993) Establishing Gender Perspectives on Information Technology: Problems, Issues and Opportunities in Green, E., Owen, J. and Pain, D. (eds.), *Gendered by Design: Information Technology and Office Systems*, London, Taylor and Francis.
19. Holland, J.L. (1985) *Making Vocational Choices: A Theory of Vocational Personalities and Work Environments*, 2nd Edition, Englewood Cliffs, NJ: Prentice Hall.
20. Johnson, R.D. and Marakas, G.M. (2000) Research Report: The Role of Behavioral Modeling in Computer Skill Acquisition: Toward Refinement of the Model, *Information Systems Research*, 11,4, 402-417.
21. Kessler, M. (2005) Fewer students major in computer, *USA TODAY*, Monday, May 23, 2005.
22. Lent, R.W., Brown, S.D., Nota, L., and Soresi, S. (2003) Testing Social Cognitive Interest and Choice Hypotheses across Holland Types in Italian High School Students, *Journal of Vocational Behavior*, 62, 101-118.
23. Lent, R.W., Brown, S.D., and Hackett, G. (1994) Toward a Unifying Social Cognitive Theory of Career and Academic Interest, Choice, and Performance, *Journal of Vocational Behavior*, 45, 79-122.
24. Leveson, N. (1989) *Women in Computer Science: A Report of the NSF/CISE Cross-Disciplinary Advisory Committee*, Publication of the National Science Foundation (202-357-3619 for NSF Forms and Publications).
25. Marakas, G.M., Yi, M.Y. and Johnson, R.D. (1998) The Multilevel and Multifaceted Character of Computer Self-Efficacy: Toward a Clarification of the Construct and an Integrated Framework for Research. *Information Systems Research*, 9, 126-162.
26. Nunnally, J.C., (1978) *Psychometric Theory*, 2nd Edition, McGraw-Hill, New York, NY.
27. Strober, M.H., and Carolyn L. Arnold, C.L. (1987) Women in Computer-Related Occupations and High-Tech Industries, in Heidi Hartmann (ed.), *Computer Chips and Paper Clips*, Washington, DC: National Academy Press.
28. Taylor, S. and Todd, P.A. (1995) Understanding Information Technology Usage: A Test of Competing Models, *Information Systems Research*, 6, 2, 144-176.
29. Vegso, J. (2005) Interest in CS as a Major Drops among Incoming Freshmen, *Computing Research News*, 17.
30. Wold, H. (1985) Systems Analysis by Partial Least Squares, in P. Nijkamp, L. Leitner, N. Wrigley (eds.), *Measuring the Unmeasurable*, Dordrecht: Marinus Nijhoff, 221-251.